ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Cross-Connection Control Programs

The New Hampshire Code of Administrative Rules Env-Ws 364 *Backflow Prevention* requires each public water system serving 1,000 or more persons to have an approved, written Cross-Connection Control Program.

Such a program can have many elements. The following is an example of a model Cross-Connection Control Program, which satisfies the minimum established criteria.

Model Cross Connection Program

I. Purpose

Cross-connections between water supplies and non-portable sources of contamination can represent one of the most significant threats to health in the water supply industry. These program regulations are designed to maintain the safety and potability of the water in the (city or town) water system by establishing rules and procedures to control cross-connection situations and to prevent the contamination of public drinking water by the backflow of water or other fluids from a source or sources other than its intended or approved source(s) of supply.

A. The purpose of this regulation is:

1. To protect the public water supply of the area served by the (city or town) water department from the possibility of contamination or pollution by isolating within its customers' internal distribution system(s) such contaminants or pollutants which could backflow of back-siphon into the public water supply system; and

2. To promote the elimination or control of existing cross-connections, actual or potential, between its customers' in-plant potable water system(s) and non-potable; and

3. To provide for the maintenance of a continuing program of cross-connection control this will effectively prevent the contamination or pollution of all potable water systems by cross-connection.

This document is intended to supplement the rules promulgated by the New Hampshire Department of Environmental Service (DES) as listed in section II below.

II. Authority

A. New Hampshire Administrative Rule Env-Ws 364, Backflow Prevention

B. The (city or town) water department rules and regulations, adopted.

III. Requirements

The water superintendent shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollution through the water service connection. If, in the judgment of the water superintendent, an approved backflow prevention device is required at the (city's or town's) water service connection to any customer's premises for the safety of the water system; the water superintendent or his designated agent shall give notice, in writing, to said customer to install an approved backflow prevention device at each service connection to his premises. The customer shall, within 90 days, install approved device or devices at his own expense; and failure, refusal, or inability on the part of the customer to install said device or devices within 90 days shall constitute a ground for discontinuing water service to the premises until such device or devices have been properly installed.

lV. Definitions

A. Approved – Accepted by the water superintendent as meeting an applicable specification stated or cited in this regulation, or as suitable for the proposed use.

B. Auxiliary Water Supply – Any water supply on or available to the premises other than the purveyor's approved public potable water supply.

C. Backflow – The flow of water or other fluids, mixtures or substances into the distributing pipes of a portable water supply system form any source other than intended approved source of supply.

D. Backflow Preventer – A device or means designed to prevent backflow or back-siphonage.

1. Air Gap – A physical separation sufficient to prevent backflow between the free- flowing discharge end of the potable water system and any other system. Physically defined as a vertical distance equal to twice the diameter of the supply side pipe diameter; but no less than 1 inch.

2. Atmospheric Vacuum Breaker – A device which prevents back-siphonage by creating an atmospheric vent when there is either a negative pressure or sub-atmospheric pressure in a water system.

3. Barometric Loop – A fabricated piping arrangement rising at least 35 feet at its topmost point above the highest fixture it supplies. It is utilized in water supply systems to protect against back-siphonage.

4. Double Check Valve Assembly – An assembly of two independently operating spring loaded check valves with tightly closing shut-off valves on each side of the check valves, plus properly located test cocks for the testing of each check valve.

5. Double Check Valve with Intermediate Atmospheric Vent – A device having two independently operating spring loaded check valves separated by an atmospheric vent chamber.

6. Hose Bibb Vacuum Breaker – A device which is connected to a hose bib and which acts as an atmospheric vacuum breaker. Not to be used under constant pressure.

7. Pressure Vacuum Breaker – A device containing one or two independently operated spring loaded check valves and an independently operated spring loaded air inlet valve located on the discharge side of the check valve(s). The device includes tightly closing shut-off valves on each side of the check valve(s) and properly located test cocks for the testing of the check valve(s).

8. Reduced Pressure Principal Backflow Preventer – An assembly consisting of two independently operating spring loaded check valves with an automatically operating differential relief valve located between the two check valves, tightly closing shut-off valves on each side of the check valves plus properly located test cocks for the testing of the check valves and the relief valve.

9. Residential Dual Check – An assembly of two spring loaded independently operating check valves without tightly closing shut-off valves and test cocks. Generally employed immediately downstream of the water meter to act as a containment device.

E. Backpressure – A condition in which the owner's system pressure is greater than the supplier's system pressure.

F. Back-Siphonage – The flow of water or other fluids, mixtures or substances into the distribution pipes of a potable water supply system from any source other than its intended source caused by the sudden reduction of pressure in the potable water supply system.

G. Containment – A method of backflow prevention which requires a backflow prevention device at the water service entrance.

H. Contaminant – A substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public leading to poisoning or the spread of disease.

I. Cross-Connection – Any actual or potential connection between the public water supply and a source of contamination or pollution.

J. Department – New Hampshire Department of Environmental Services (DES).

K. Fixture Isolation – A method of backflow prevention in which a backflow preventer is located to correct a cross-connection at an in-plant location rather than at a water service entrance.

L. Owner – Any person who has legal title to, or license to operate or habitat in, a property upon which a cross-connection inspection is to be made or upon which a cross-connection is present.

M. Person – Any individual, partnership, company public or private corporation political subdivision or agency of the State, department, agency or instrumentality or the Unites States or any other legal entity.

N. Permit – A document issued by the water supplier which allows the use of a backflow preventer.

O. Pollutant- A foreign substance, that if permitted to get into the public water system, will degrade its quality so as to constitute a moderate hazard, or impair the usefulness or quality of

the water to a degree which does not create an actual hazard to the public health; but which does adversely and unreasonably effect such water for domestic use.

P. Water Service Entrance – That point in the owner's water system beyond the sanitary control of the water supplier; generally considered to be the outlet end of the water meter and always before any unprotected branch.

Q. Water Superintendent – The official, or his delegated representative in charge of the (city or town) water department is invested with the authority and responsibility for the implementation of an effective cross-connection control program and for the enforcement of the provisions of this ordinance.

R. Water Supplier – The public water supply system.

V. Administration

A. The (city or town) water department will operate a cross-connection control program, to include the keeping of necessary records, which fulfills the requirements of the DES's Backflow Control Rules and is approved by DES.

B. The owner shall allow his property to be inspected for possible cross-connections and shall follow the provisions of the (city or town) water department's program and the DES's rules, if a cross-connection is permitted.

C. If the (city or town) water department requires that the public supply be protected by containment, the owner shall be responsible for the water quality beyond the outlet end of the containment device and should utilize fixture outlet protection for that purpose.

D. The owner may utilize trained or experienced personnel to assist him in the selection of proper fixture outlet devices, and the proper installation of these devices.

E. Both the (city or town) water department and the owner shall attempt to eliminate all cross-connections.

VI. Responsibilities

A. (City or Town) Water Department

1. On new installations, the (city or town) water department will provide an on-site , evaluation and/or inspection of plans in order to determine the type of backflow preventer, if any, that will be required, will issue a permit, and perform inspection and testing. In any case, a minimum of a dual check valve will be required in any new construction.

2. For premises existing prior to the start of this program, the (city or town) water department will perform evaluations and inspections of plans and/or premises and inform the owner by letter of any corrective action deemed necessary, the method of achieving the correction, and the time allowed for the correction to be made. Ordinarily, [90] days will be allowed. However, this time period may be shortened depending upon the degree of hazard involved and the history of the device(s) in question.

3. The (city or town) water department will not allow any cross-connection to remain unless it is protected by an approved backflow preventer for which a permit has been issued and which will be regularly inspected to insure satisfactory operation.

4. The (city or town) water department shall inform the owner, by letter, of any failure to comply by the time of the first re-inspection. The (city or town) water department will allow an additional [15] days for the correction. In the event the owner fails to comply with the necessary correction by the time of the second re-inspection, the (city or town) water department will inform the owner, by letter, that the water service to the owner's premises will be terminated within a period not to exceed [5] days. In the event that the owner informs the (city or town) water department of extenuating circumstances as to why the correction has not been made, a time extension may be granted by the (city or town) water department, but in no case will exceed an additional [30] days.

5. If the (city or town) water department determines at any time that a serious threat to the public health exists, the water service will be terminated immediately.

6. The (city or town) water department shall begin initial premise inspections to determine the nature of existing hazards and corrections to be made, following approval of the program by DES. Initial focus will be on high hazard industries and commercial premises.

7. The (city or town) water department shall have on its staff a person who is a certified backflow prevention device inspector.

8. Certified backflow prevention device inspectors must be certified as determined by DES.

B. Owner

1. The owner shall be responsible for the elimination or protection of all cross-connections on his premises.

2. The owner, after having been informed by a letter from the (city or town) water department, shall at his expense, install, maintain, and inspect or have inspected, any and all backflow preventers on his premises.

3. The owner shall correct any malfunction of the backflow preventer which is revealed by periodic inspecting. This shall include the replacement of parts or the replacement of the backflow preventer, if deemed necessary by the (city or town) water department.

4. The owner shall inform the (city or town) water department of any proposed or modified cross-connections and also existing cross-connections of which the owner is aware, but has not been found by the (city or town) water department.

5. The owner shall not install a by-pass around any backflow preventer unless there is a backflow preventer of the same type on the by-pass. Owners who cannot shut down operations for inspecting of the device(s) must supply additional devices necessary to allow inspecting to take place.

6. The owner shall install backflow preventers in a manor and location approved by the (city or town) water department.

7. The owner shall only install backflow preventers approved by the (city or town) water department or DES.

8. Any owner having a private well or other private water source, must have a permit if the well or source is cross-connected to the (city or town) water department's system. Permission to cross-connect may be denied by the (city or town) water department. The owner may be required to install a backflow preventer at the service entrance if a private water source is maintained, even if it is not cross-connected to the (city or town) water department's system.

9. In the event the owner installs plumbing to provide potable water for domestic purposes which is on the (city of town) water department's side of the backflow preventer, such plumbing must have its own backflow preventer installed.

10. The owner shall be responsible for the payment of all fees for permits, annual or semi-annual device inspections, re-testing in the case that the device fails to operate correctly, and second re-inspections for non-compliance with the (city or town) water department or DES requirements.

VII. Degree of Hazard

The (city or town) water department recognizes the threat to the public water system arising from cross-connections. All threats will be classified by degree of hazard and will require the installation of approved backflow prevention devices for high and low hazards.

A. Low Degree of Hazard

If backflow were to occur, the resulting effect on the water supply would be a change in its aesthetic qualities. The foreign substance must be non-toxic to human.

B. High Degree of Hazard

If backflow were to occur, the resulting effect on the water supply could cause illness or death if consumed by humans. The foreign substance may be toxic to humans rather from a chemical, bacteriological or radiological standpoint. The effects of the contaminants may result from short or long term exposure.

Only the following types of backflow prevention devices may be used for the containment of on-site contaminants for high and low hazard situations respectively:

C. High Hazard:

a. Air gap (AG)
b. Reduced pressure principal backflow preventer (RPZ)
c. Combination of the above

D. Low Hazard:

a. Air gap (AG)
b. Atmospheric vacuum breaker (AVB)
c. Pressure vacuum breaker (PVB)
d. Double check valve assembly (DCVA)

e. Reduced pressure principal backflow preventer (RPZ)
f. Combination of the above

VIII. Permits

The (city or town) water department shall not permit a cross-connection within the public water supply system unless it is considered necessary and that it cannot be eliminated.

A. Cross-connection permits that are required for each backflow prevention device are obtained from the (city or town) water department. A fee of [ ] dollars will be charged for the initial permit and [ ] dollars for the renewal of each permit.

B. Permits shall be renewed every [ ] years and are non-transferable. Permits are subject to revocation and become immediately revoked if the owner should so change the type of cross-connection or degree of hazard associated with the service.

C. A permit is not required when fixture isolation is achieved with the utilization of a non-testable backflow preventer.

IX. Existing in-use Backflow Devices

Any existing backflow preventer shall be allowed by the (city or town) water department to continue in service unless the degree of hazard is such as to supersede the effectiveness of the present backflow preventer, or result in an unreasonable risk to the public health.

X. Periodic Testing

A. Backflow prevention devices shall be inspected and tested at least semi-annually for high hazard devices and annually for low hazard devices.

B. Periodic inspections shall be performed by the (city or town) water department's certified inspector or his delegated representative. The inspections will be done at the owner's expense.

C. The inspections shall be conducted during the (city or town) water department's regular business hours. Exceptions to this, when at the request of the owner, may require additional charges to cover the increased costs to the (city or town) water department.

D. Any backflow preventer which fails during a periodic inspection will be repaired or replaced. When repairs are necessary, upon completion of the repair the device will be inspected a second time at the owner's expense to insure correct operation. High hazard situations will not be allowed to continue unprotected, if the backflow preventer fails the inspection and cannot be repaired immediately. In other situations, a compliance date of not more than [30] days after the inspection date will be established. The owner is responsible for spare parts, repair tools, or a replacement device. Parallel installation of two devices is an effective means of the owner insuring that uninterrupted water service during inspections or repair of devices; and is strongly recommended when the owner desires such continuity.

E. These devices shall be repaired or replaced at the expense of the owner whenever said devices are found to be defective. Tests and repairs shall be recorded on forms approved by the water superintendent; and copies distributed to the owner and water superintendent within [ ] days of the actual test.

F. Backflow prevention devices will be inspected more frequently than specified in A. above, in cases where there is a history of test failures and the (city or town) water department feels that due to the degree of hazard involved, additional inspections are warranted. Cost of the additional inspections will be borne by the owner.

XI. Records and Reports

A. Records – The (city or town) water department will initiate and maintain the following:

1. Master files on customer cross-connection inspections and/or tests.
2. Master files on cross-connection permits.
3. Copies of permits and permit applications.
4. Copies of inspection results and summaries supplied to DES.

B. Reports – The (city or town) water department will submit the following to DES:

1. A copy of annual inspection reports or summaries.

XII. Fees and Charges

The (city or town) water department will publish a list of fees or charges for the following permits:

A. Fees

1. Inspection fees
2. Fees for re-inspections

B. Charges

1. Charges for after hours inspections

Addendum

I. Residential Dual Check

A. Effective the date of acceptance of this Cross-Connection Control Program for the (city of town), all new residential buildings will be required to install a residential dual check valve device immediately downstream of the water meter. Installation of this residential dual check valve device on a retrofit basis on existing service lines will be instituted at a time and at a potential cost to the homeowner as deemed necessary by the (city or town) water department.

B. The owner should be aware that installation of a residential dual check valve results in a potential closed plumbing system with the residence. As such, provisions may have to be made by the owner to provide for thermal expansion within the closed loop system, i.e., the installation of thermal expansion devices and/or pressure relief valves.

II. Strainers

A. The (city or town) water department strongly recommends that all new retrofit installations of reduced pressure principle devices and double check valve backflow preventers include the

installation of strainers located immediately upstream of the device to prevent fouling of backflow devices due to unforeseen circumstances occurring to the water supply system such as water main repairs, water main breaks, fires, periodic cleaning and flushing of mains, etc. These occurrences may 'stir up' debris within the water main that will cause fouling of backflow devices installed without the benefit of strainers.

For Additional Information

Please contact the Drinking Water and Groundwater Bureau at (603) 271-2513 or dwgbinfo@des.state.nh.us or visit our website at www.des.nh.gov/dwgb. All of the bureau's fact sheets are on-line at www.des.nh.gov/dwg.htm.

Note: This fact sheet is accurate as of January 2007. Statutory or regulatory changes, or the availability of additional information after this date may render this information inaccurate or incomplete.